

ABSTRACT OF THE DISCLOSURE

The present invention provides a system and method for binder removal and sintering of materials such as ceramic materials and products, LTCC intervals, solid oxide fuel cells and powder metals. A combination of microwave and convection/radiation heating is employed for binder removal and sintering. Preferably, the microwave heating is accomplished using a variable or multi-frequency microwave source. A gas atmosphere is provided in the furnace chamber by one or more eductors which produces a high volume gas circulation in the furnace chamber to achieve a highly uniform gas environment and temperature. The process in accordance with the invention controls the heating cycle, the heat sources and thermal profile depending upon the composition of the particular material being processed. The thermal processing can be accomplished in a batch furnace in which a product is loaded for processing and unloaded after processing. The invention can also be practiced in a continuous process wherein the product is conveyed between furnace sections or chambers of a furnace.

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